

Post-ASH 2020 webinar MPE

Multiple myeloma and AL amyloidosis



Content

Introduction

Newly diagnosed MM

- Transplant eligible / role of autologous stem cell transplant
- Non-transplant eligible

Relapsed/refractory MM (RRMM) - early relapse

- Based on IMiD, PI, anti-CD38

Relapsed/refractory MM - late relapse

- Bispecifics
- CAR-T
- Antibody drug conjugates

AL amyloidosis

Take home messages



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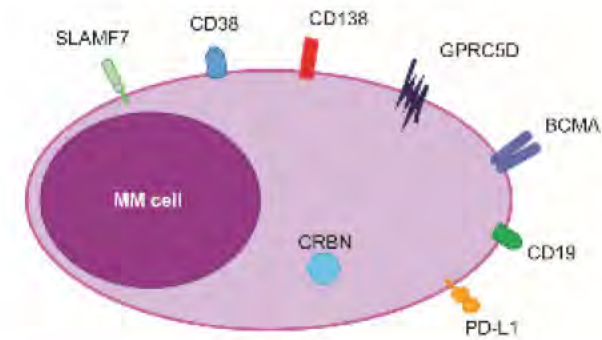
- Bispecifics
- CAR-T
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AL amyloidosis

Take home messages



Introduction



Classical “novel” agents

- **Immunomodulatory agents**
Thalidomide
Lenalidomide
Pomalidomide

- **Proteasome inhibitors**
Bortezomib
Carfilzomib
Ixazomib

- **Anti-CD38 antibodies**
Daratumumab
Isatuximab

Immunotherapy

- **Bispecific antibodies (BiTes)**
Teclistamab
Talquetamab

- **CAR-T cell therapy**
Ide-cel (bb2121)
Cilta-cel
And many more...

- **Antibody drug conjugates**
Belantamab-mafodotin
...

- **Other targeted therapies**
Panobinostat
Selinexor
Venetoclax



Introduction - study phases

Phase 1 → to evaluate **safety** of a new drug

- To find the RP2D: recommended phase 2 dose

Phase 2 → to further assess **safety**, as well the **effectiveness** of a new drug

Phase 3 → to compare the effectiveness and safety of the new treatment **versus current treatment**

Based on the evidence of studies → EMA (European Medicines Agency) can approve drug(s)

Per country different timelines concerning approval and reimbursement of treatment regimens



Introduction

ORR is “overall response rate”

Including

Partial response (PR)

Very good partial response (VGPR)

Complete response (CR)

Stringent complete response (sCR)

MRD = minimal residual disease

Reduction M-protein

50-90%

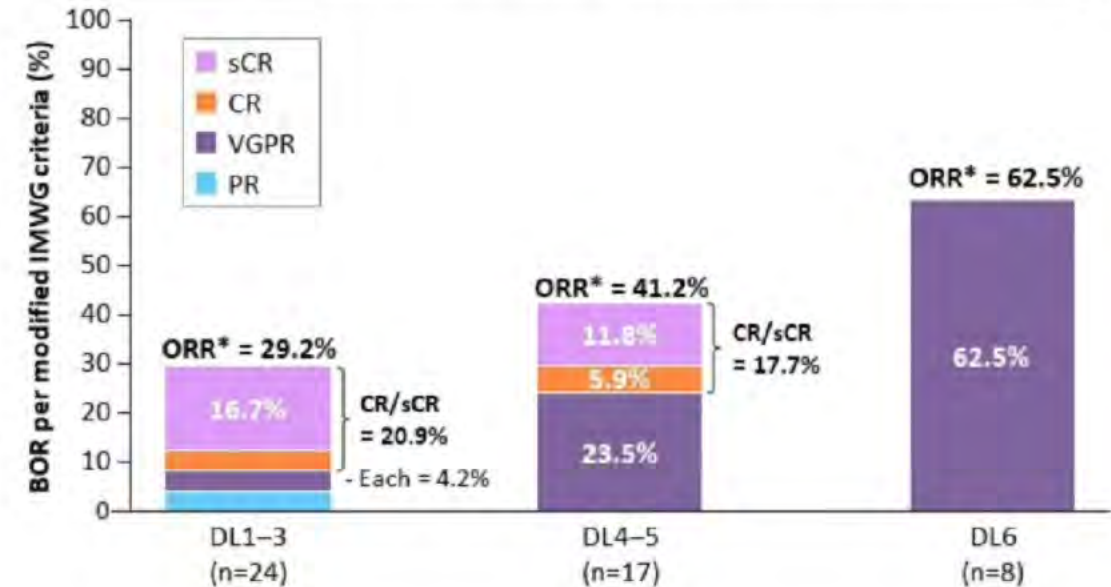
90-99%

100%

when bone marrow clean

more sensitive

Observed median duration of follow-up (range): 2.6 (0.5–13.4) months





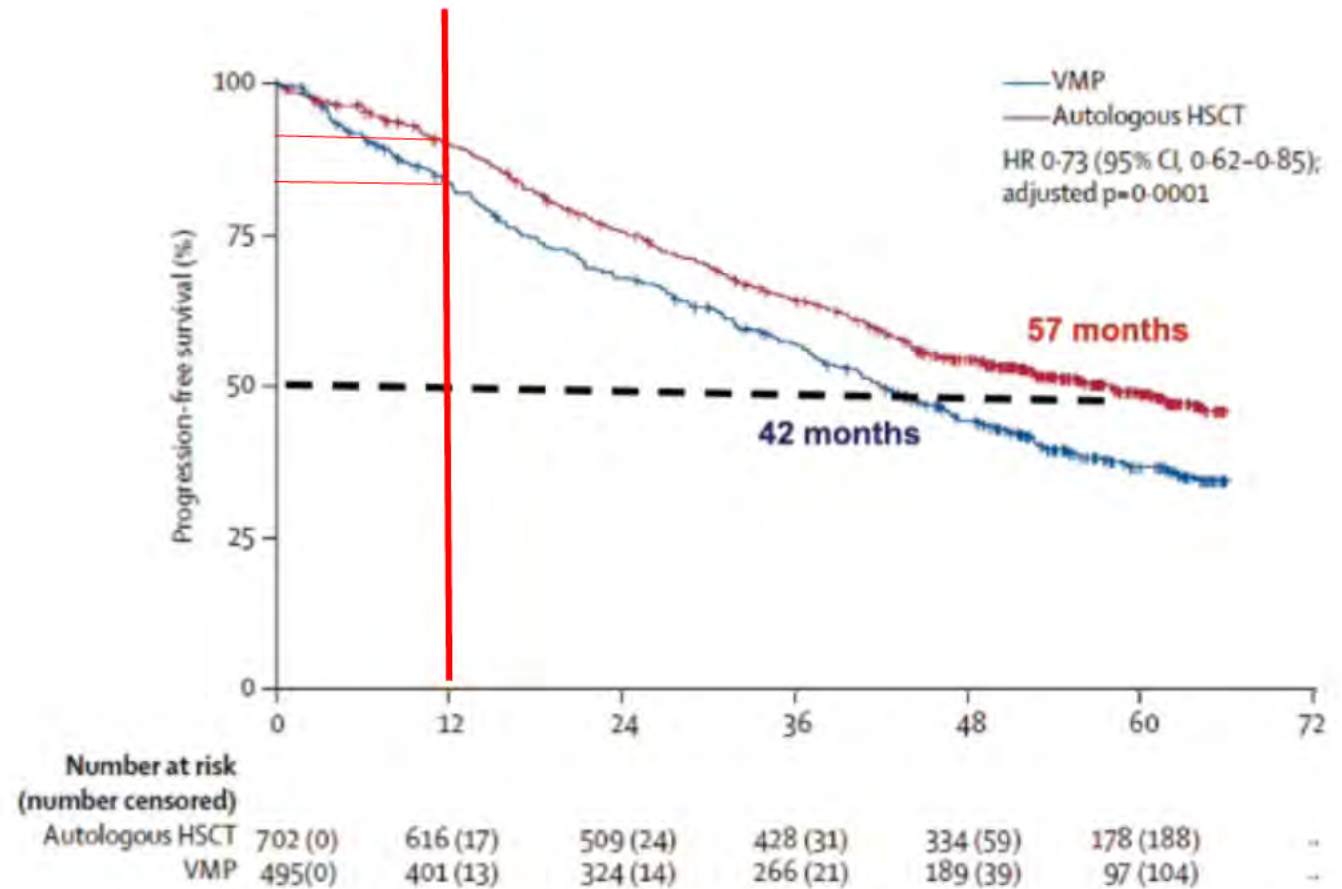
Introduction

PFS = progression free survival

- time from start treatment to disease progression or death

PFS curve

- Dotted line is median PFS
(50% of patients alive without disease progression)
- Red vertical line is 12 months PFS
(% of patients alive at 12 months without disease progression)





Introduction

To classify side effects:

- Grade 1 / 2: relative mild
- Grade 3 / 4: more severe
- Grade 5: death





Highlighting the highlights of ASH 2020

Therapies
for newly
diagnosed
MM

Therapies for
relapsed and
refractory MM

Preclinical studies
(not in human)



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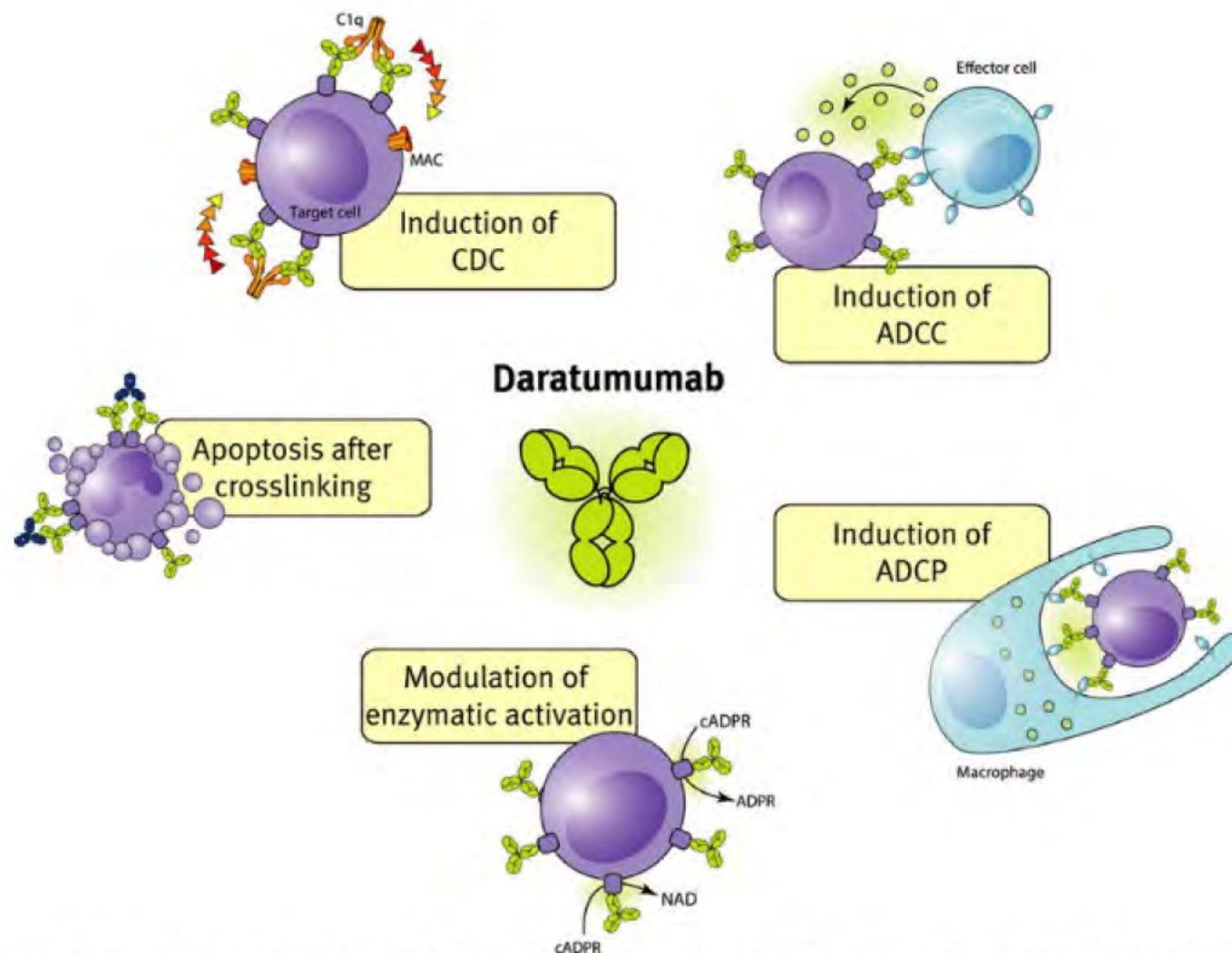
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AL amyloidosis

Take home messages



Phase 3 Trials

RRMM

- D-Rd (POLLUX)
- D-Vd (CASTOR)
- D-Pd (APOLLO)
- D-Kd (CANDOR)

NDMM non-transplant

- D-Rd (MAIA)
- D-VMP (ALCYONE)
- D-VRd (CEPHEUS)*

NDMM transplant

- D-VTd Part 1 (CASSIOPEIA)
 - D maintenance Part 2
- D-VRd (PERSEUS)*
 - D-R maintenance^a
- D-R maintenance (AURIGA)*

*Pending results.

^aDiscontinue D if MRD negative.

CDC, complement-dependent cytotoxicity; ADCP, antibody-dependent cellular phagocytosis; ADCC, antibody-dependent cell-mediated cytotoxicity; NK, natural killer; RRMM, relapsed/refractory multiple myeloma; D, daratumumab; R, lenalidomide; d, dexamethasone; V, bortezomib; P, pomalidomide; K, carfilzomib; NDMM, newly diagnosed multiple myeloma; MP, melphalan and prednisone; T, thalidomide; SC, subcutaneous; MRD, minimal residual disease. 1. DARZALEX® (daratumumab) injection, for intravenous use [package insert]. Horsham, PA: Janssen Biotech, Inc.; 2020. 2. Liszewski MK, et al. *Adv Immunol.* 1996;61:201-283. 3. Debets JM, et al. *J Immunol.* 1988;141(4):1197-1201. 4. Overdijk MB, et al. *MAbs.* 2015;7(2):311-321. 5. Lokhorst HM, et al. *N Engl J Med.* 2015;373(13):1207-1219. 6. Plesner T, et al. Oral presentation at: ASH; December 8-12, 2012; Atlanta, GA. Abstract 73. 7. Krejci J, et al. *Blood.* 2016;128(3):384-394. 8. Adams HC 3rd, et al. *Cytometry A.* 2019;95(3):279-289. 9. Casneuf T, et al. *Leukemia.* 2020 May 26;doi: 10.1038/s41375-020-0855-4; [E-pub ahead of print].



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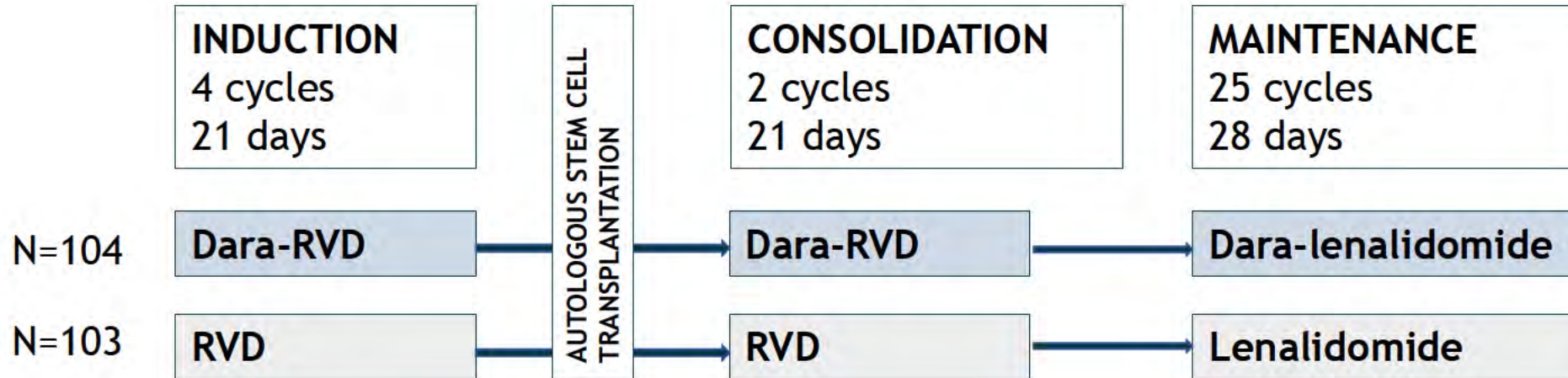
Take home messages



Newly diagnosed MM

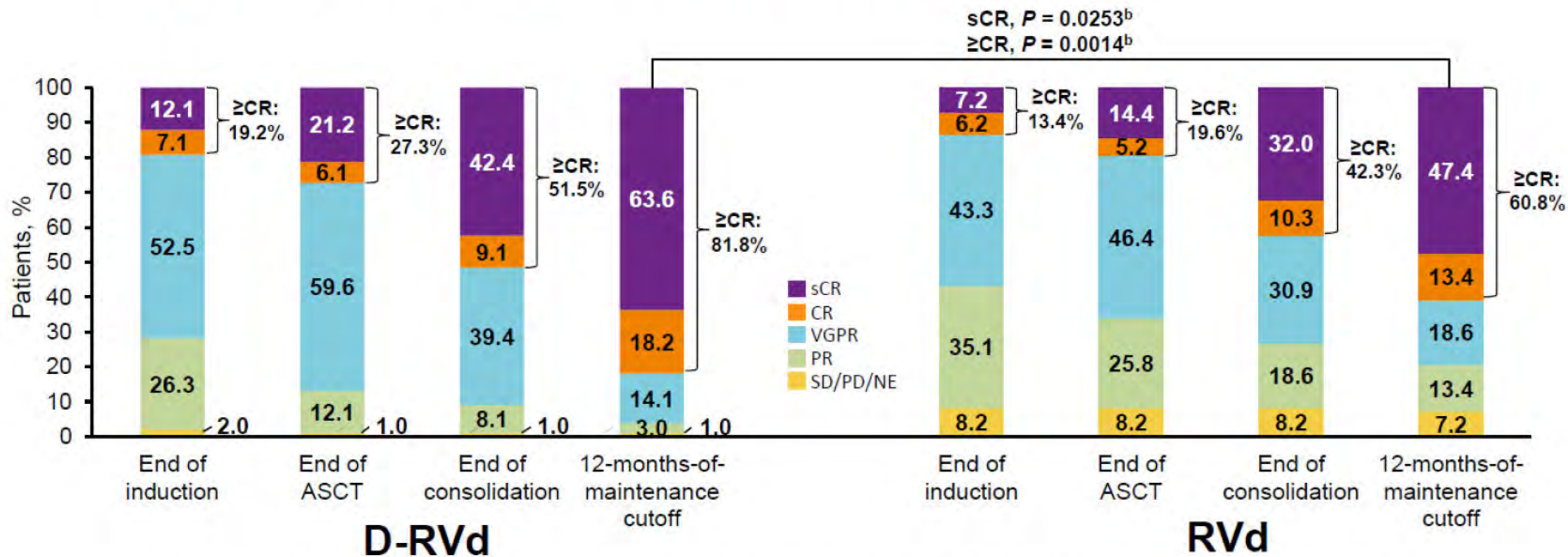
Transplant eligible

GRIFFIN trial: dara-RVD vs RVD



Dara: daratumumab; N: number; RVD: lenalidomide-bortezomib-dexamethasone

Responses Deepened over Time^a



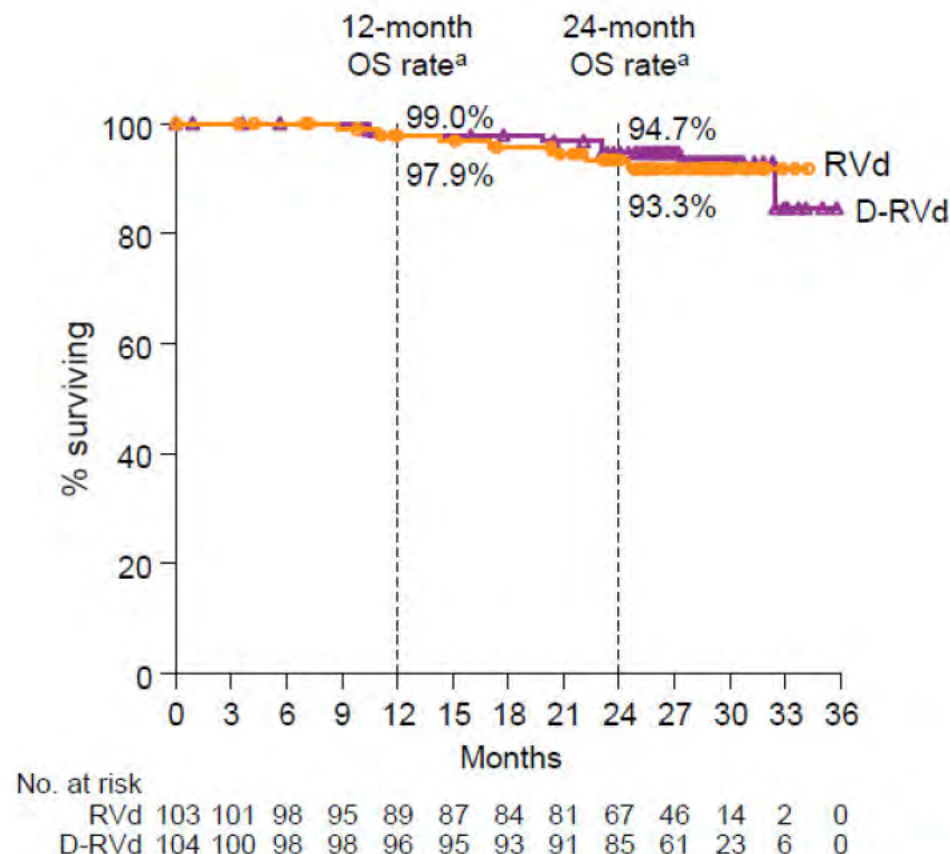
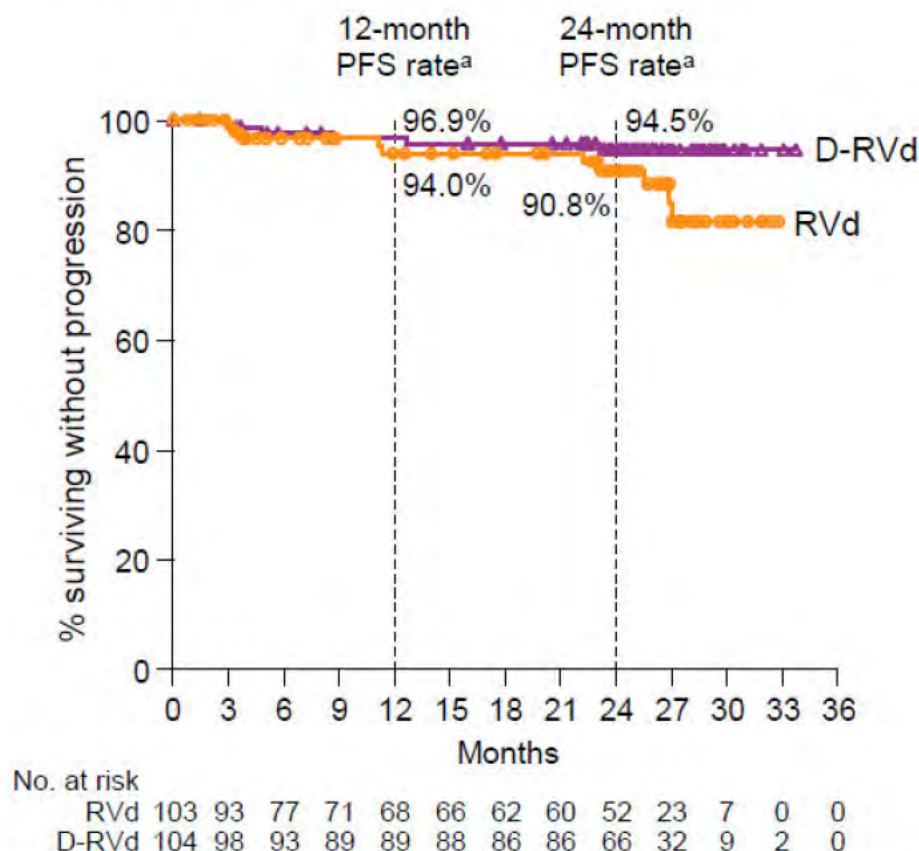
- Results for end of induction, ASCT, and consolidation are based on a median follow up of 13.5 months at the primary analysis
- Median follow up at 12-months-of-maintenance therapy cutoff was 27.4 months

Response rates and depths were greater for D-RVd at all time points

PR, partial response. SD/PD/NE, stable disease/progressive disease/not evaluable. ^aData are shown for the response-evaluable population. ^b P values (2-sided) were calculated using the Cochran–Mantel–Haenszel chi-square test.

PFS and OS in the ITT Population

- Median follow-up = 27.4 months



Median PFS and OS were not reached for D-RVd and RVd

OS, overall survival. ^aKaplan-Meier estimate.



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Newly diagnosed MM

Transplant eligible - role of autologous stem cell transplantation

Is there still a role for autologous stem cell transplant?

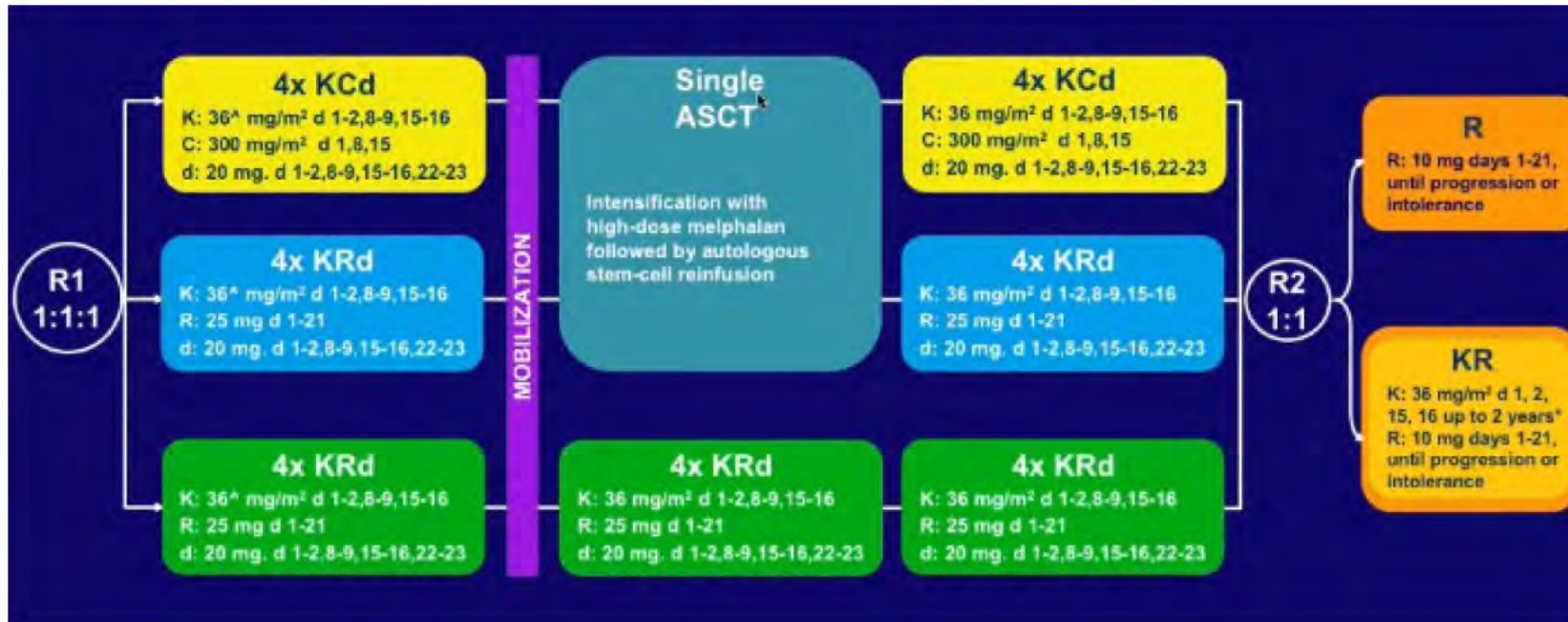
- I. FORTE trial
- II. Long term follow-up EMN-2/HOVON95 study
- III. IFM 2009 trial - long term follow-up



Newly diagnosed MM

Transplant eligible - role of autologous stem cell transplantation

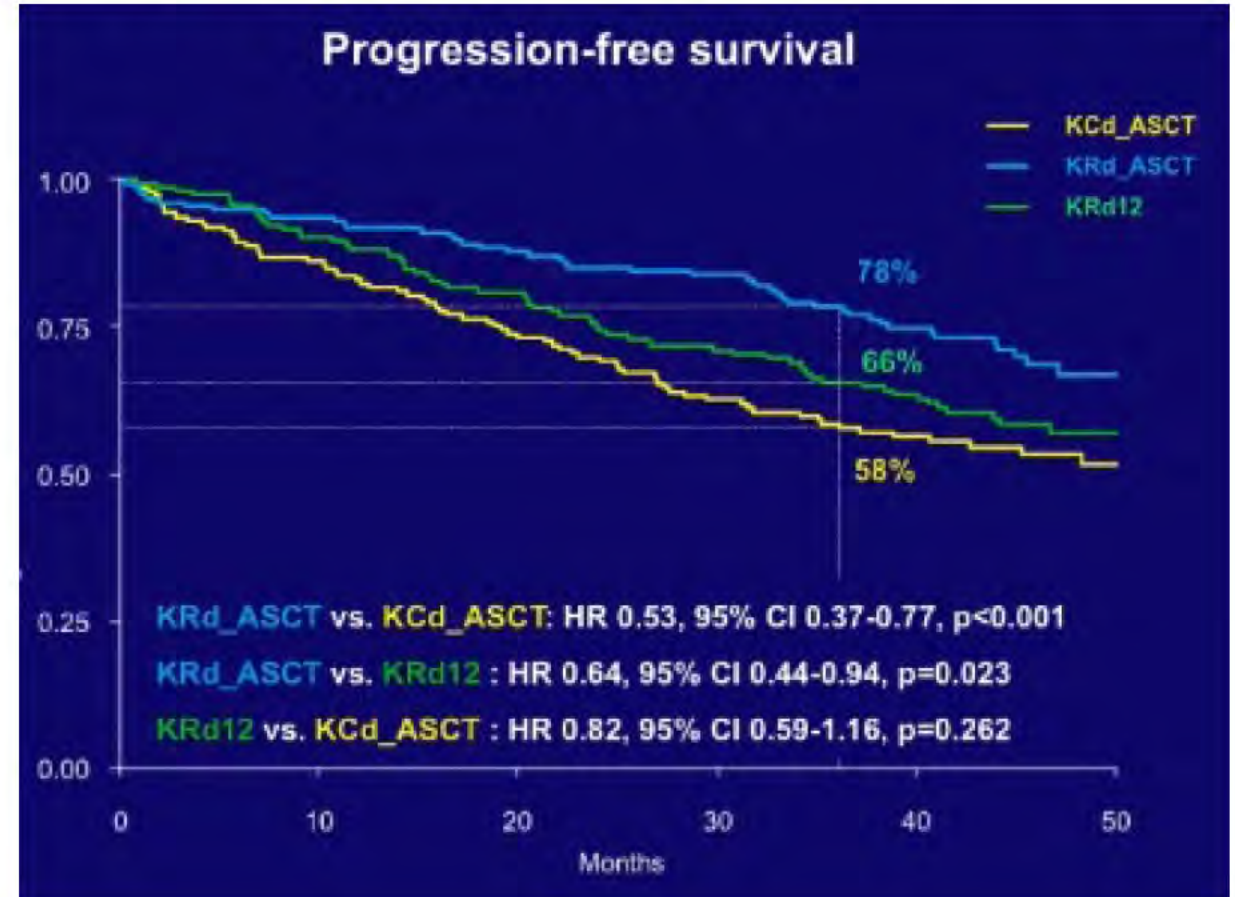
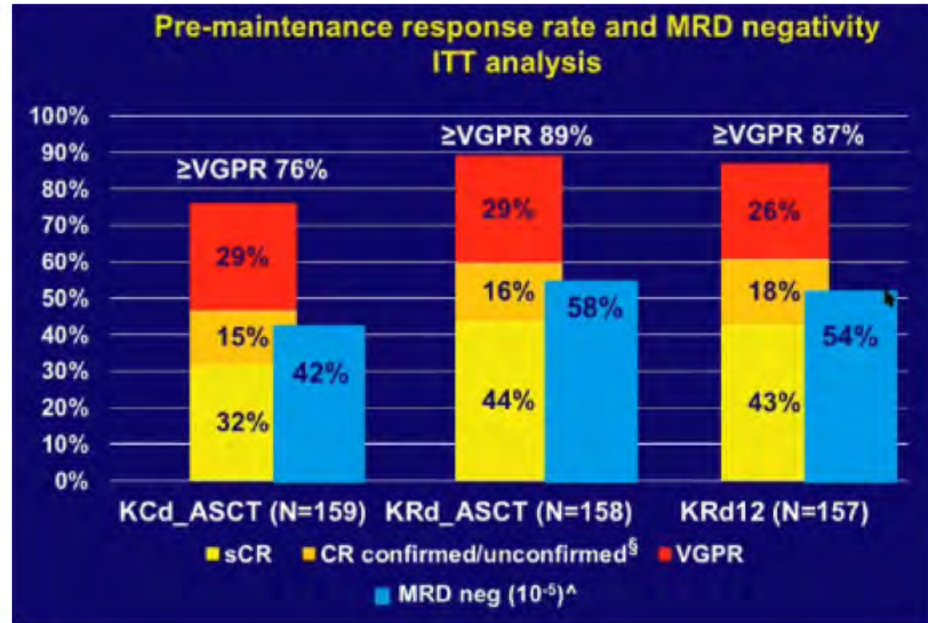
Forte trial: 474 patients, < 65 years





Newly diagnosed MM

Transplant eligible - role of autologous stem cell transplantation





Newly diagnosed MM

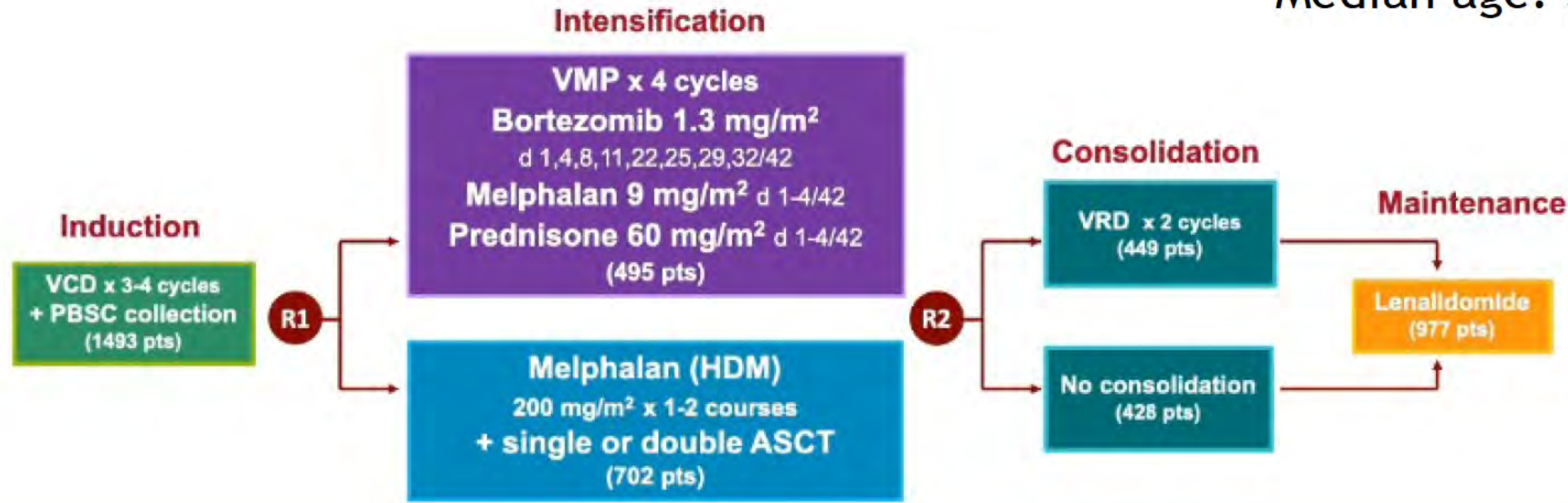
Transplant eligible - role of autologous stem cell transplantation

Long term follow-up EMN-2/HOVON95 study

Arm VMP: 495 pt

Arm HDM: 702 pt

Median age: 58y



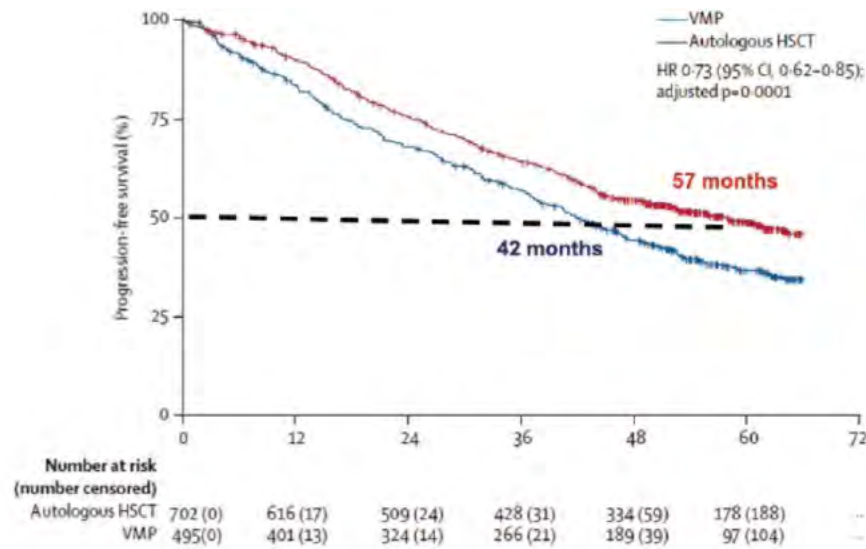


Newly diagnosed MM

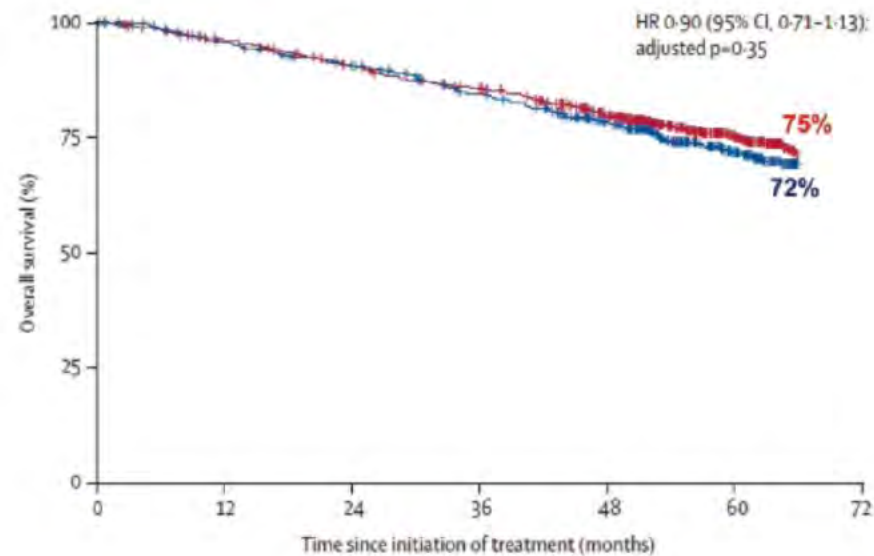
Transplant eligible - role of autologous stem cell transplantation

Long term follow-up EMN-2/HOVON95 study

PFS



OS



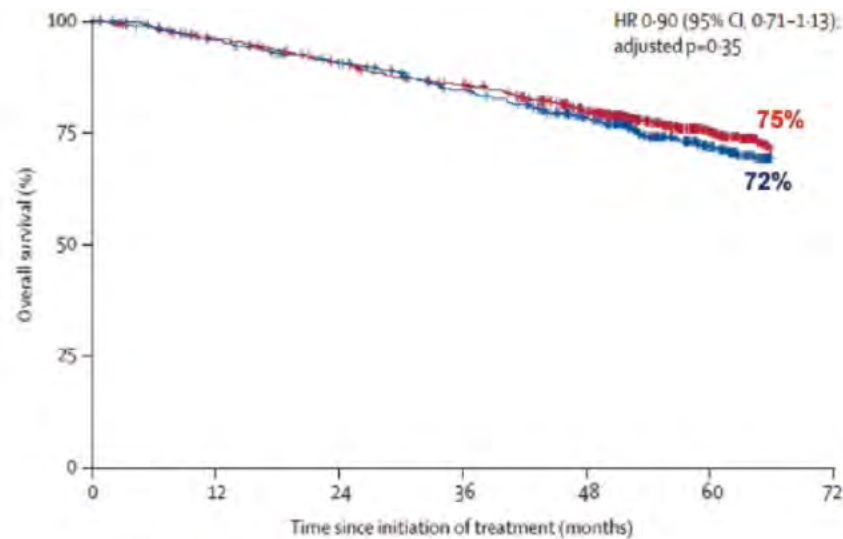


Newly diagnosed MM

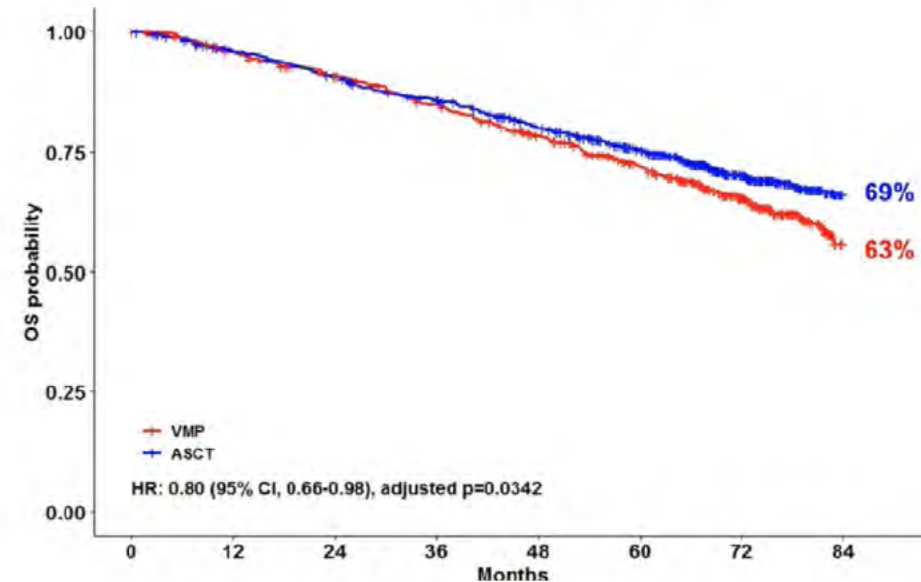
Transplant eligible - role of autologous stem cell transplantation

Long term follow-up EMN-2/HOVON95 study

OS



OS longer FU





Newly diagnosed MM

Transplant eligible - role of autologous stem cell transplantation

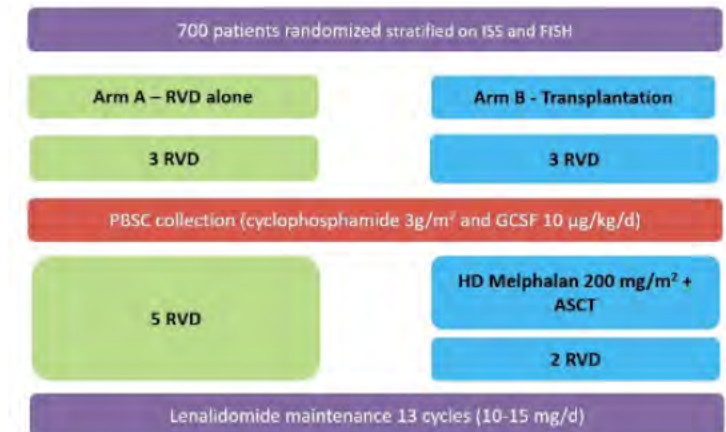
IFM 2009 trial - long term follow-up

Arm A: 8x RVD, followed by lenalidomide maintenance

Arm B: 3x RVD + HDM/ASCT + 2x RVD, followed by lenalidomide maintenance

Interim analysis at 44months follow-up:

Median PFS 36 vs 50 months

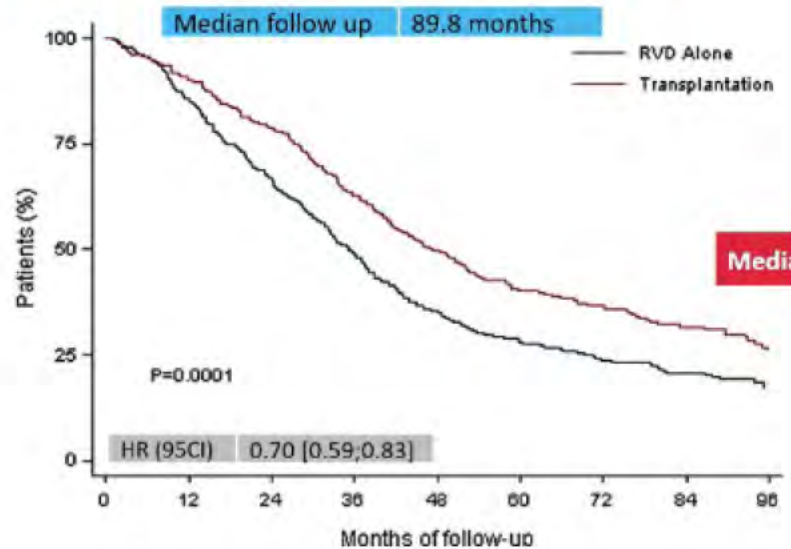




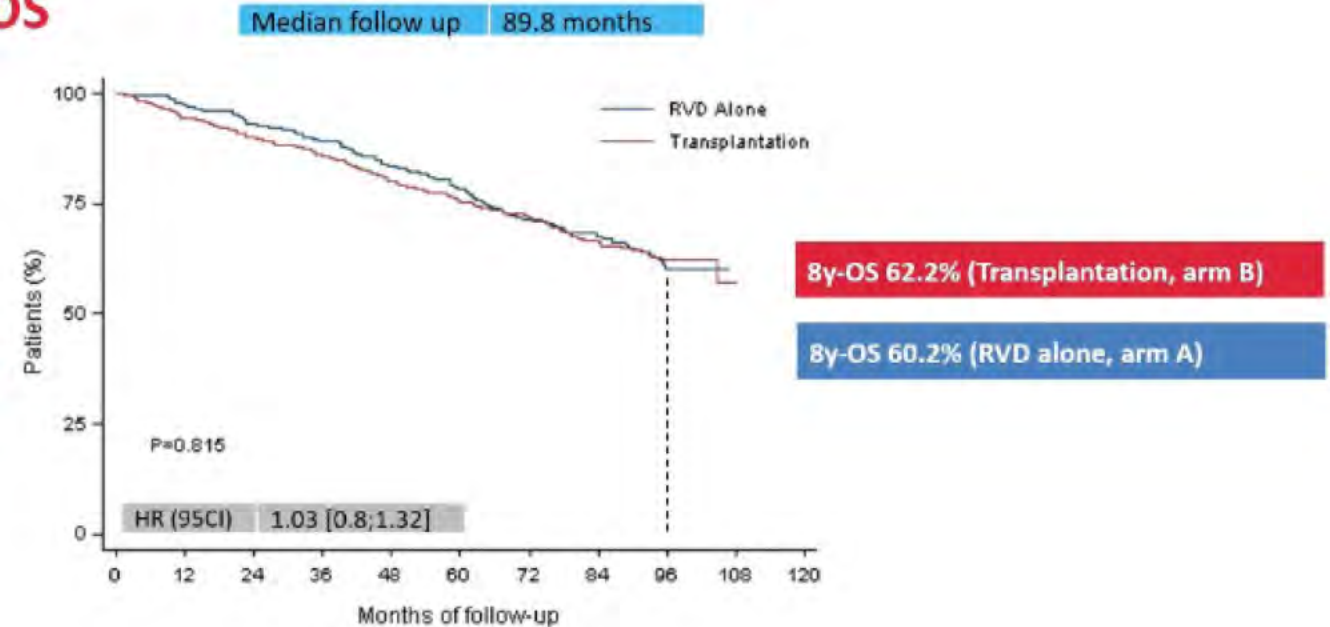
Newly diagnosed MM

Transplant eligible - role of autologous stem cell transplantation

Updated PFS (primary endpoint)



OS





Newly diagnosed MM

Transplant eligible - role of autologous stem cell transplantation

Is there still a role for autologous stem cell transplant?

- | | |
|---|-----|
| I. FORTE trial | YES |
| II. Long term follow-up EMN-2/HOVON95 study | YES |
| III. IFM 2009 trial - long term follow-up | YES |

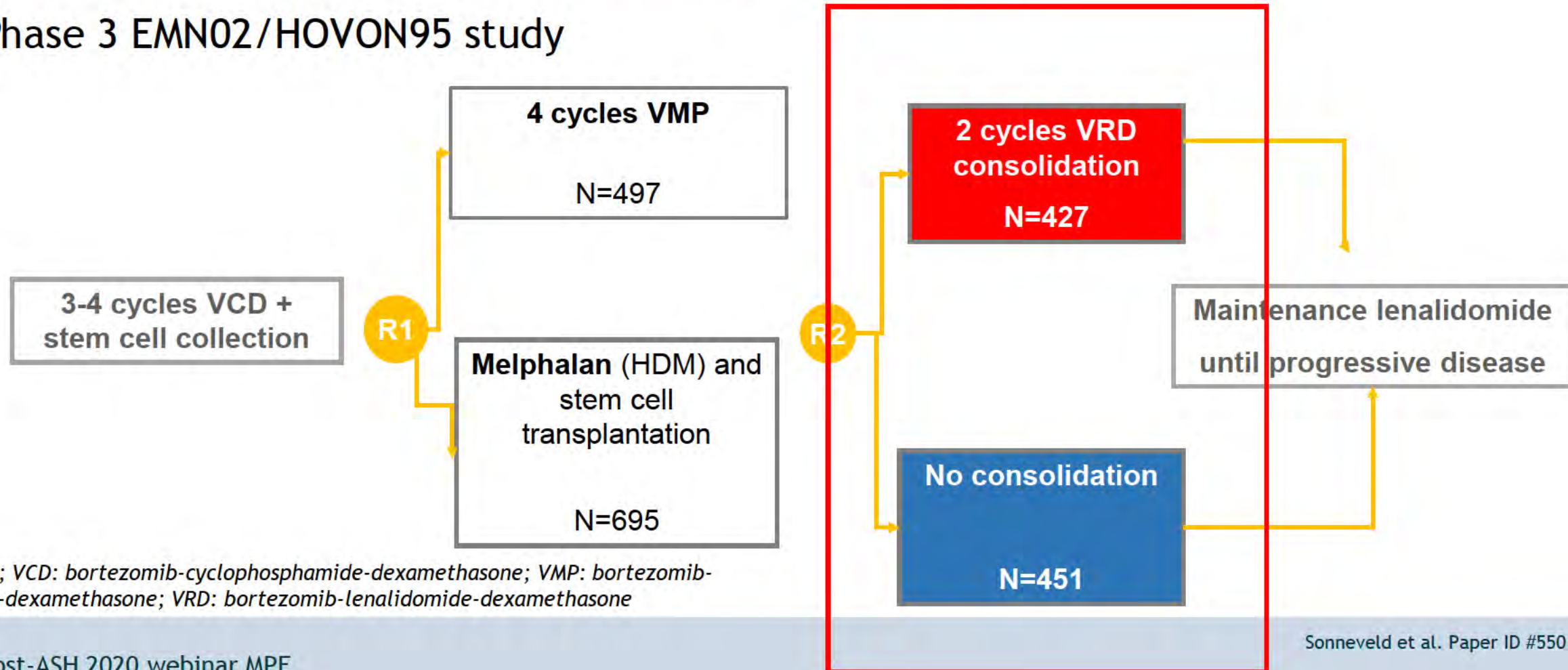
Note: these studies don't contain daratumumab → effect on role ASCT?



Newly diagnosed MM

Transplant eligible - consolidation treatment

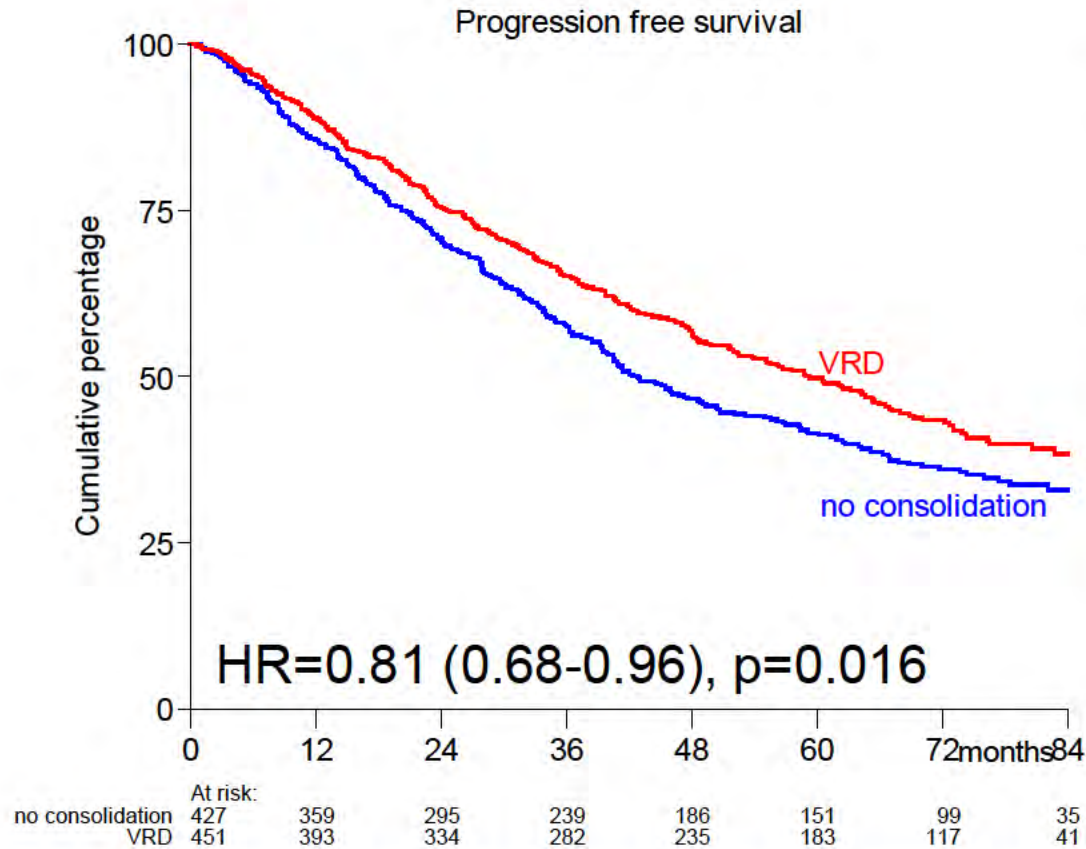
Phase 3 EMN02/HOVON95 study





Newly diagnosed MM

Transplant eligible - consolidation treatment



	no consolidation	VRD
Patients #	427	451
Best response %		
sCR	23 > 46%	35 > 59%
CR	23	24
VGPR	41	30
≤ PR	14	11

Difference in (s)CR rate: $p < 0.001$



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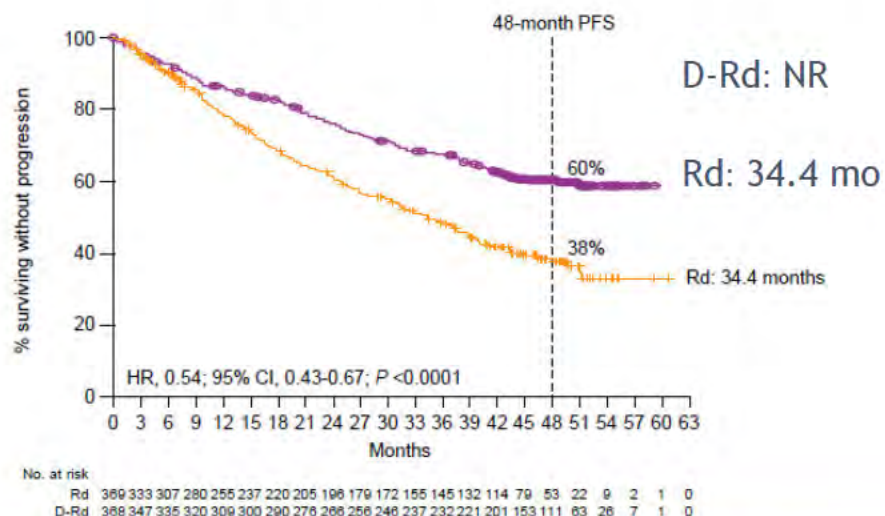
Newly diagnosed MM

Non-transplant eligible



Dara-Rd vs Rd (MAIA)¹

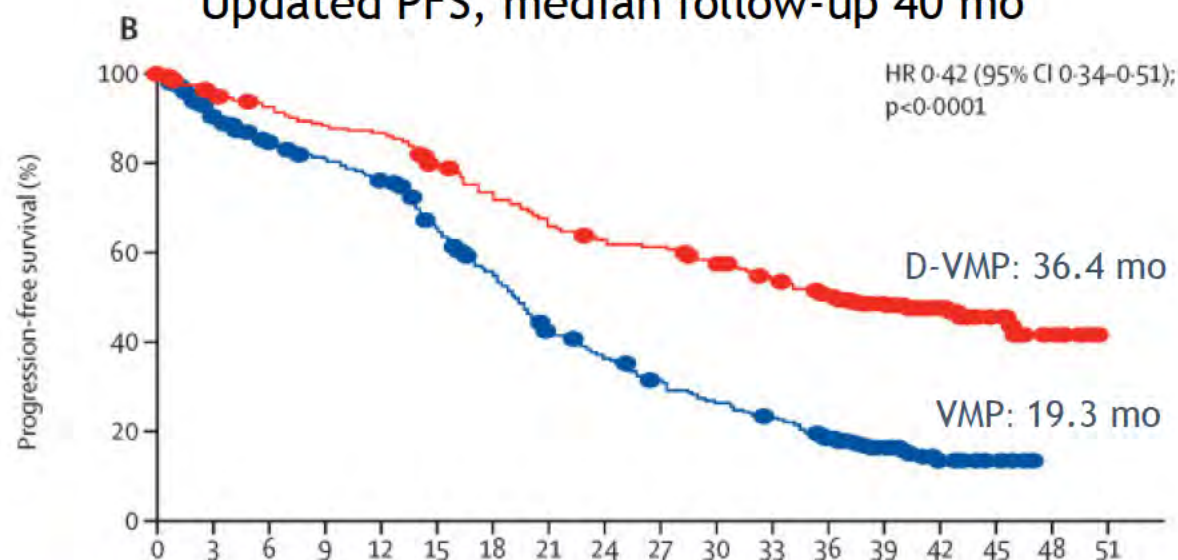
Updated PFS, median follow-up 48 mo



D-Rd demonstrated a significant benefit in PFS, with a 46% reduction in the risk of progression or death

Dara-VMP vs VMP (ALCYONE)²

Updated PFS, median follow-up 40 mo



D-VMP demonstrated a significant benefit in PFS, with a 58% reduction in the risk of progression or death

Daratumumab subcutaneous versus intravenously

(A) RRMM with 1 prior line of therapy

Median follow-up

Primary
9.2 mo

CANDOR^b
~17 mo

(B) RRMM with ≥ 1 prior line of therapy

Median follow-up

Update
25.7 mo

POLLUX^c
54.8 mo

(C) Transplant-ineligible NDMM

Median follow-up

Update
25.2 mo

ALCYONE^d
40.1 mo

Daratumumab subcutaneous versus intravenously:

- At least similar response rates
- Reduced administration time
- Lower rates of infusion related reactions

Therefore: advantage of subcutaneous administration



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ORR, overall response rate; D-Kd, daratumumab subcutaneous plus carfilzomib/dexamethasone; Kd, carfilzomib/dexamethasone; D-Rd, daratumumab subcutaneous plus lenalidomide/dexamethasone; Rd, lenalidomide/dexamethasone; D-VMP, daratumumab subcutaneous plus bortezomib/melphalan/prednisone; VMP, bortezomib/melphalan/prednisone; DARA IV, daratumumab intravenous; RRMM, relapsed or refractory multiple myeloma; NDMM, newly diagnosed multiple myeloma; PR, partial response; VGPR, very good partial response; CR, complete response; sCR, stringent complete response.
*All-treated population, defined as patients who received ≥ 1 dose of study treatment. ^bDimopoulos M, et al. *Lancet*. 2020;395(10245):186-197. ^cKaufman JL, et al. Presented at: 61st American Society of Hematology (ASH) Annual Meeting & Exposition; December 7-10, 2019; Orlando, FL. Abstract 1886. ^dMateos MV, et al. *Lancet*. 2020;395(10218):132-141. ^eIn CANDOR, sCR could not be differentiated due to lack of kappa/lambda ratio by immunohistochemistry.



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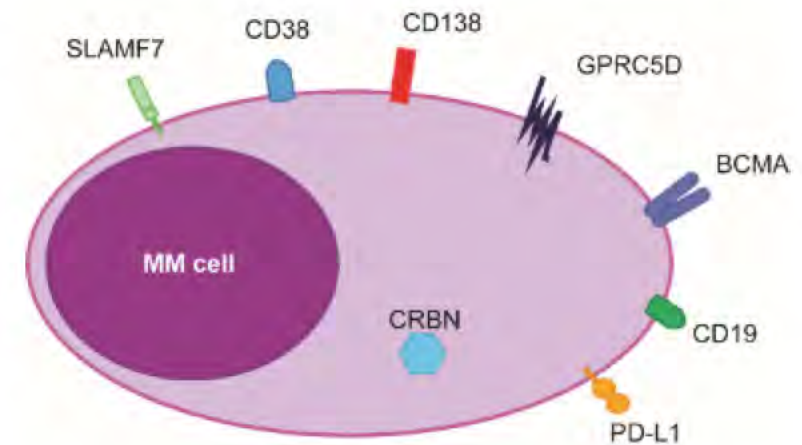


Relapse/refractory MM (RRMM) - early relapse

Based on IMiD, PI, anti-CD38

Three studies to discuss:

Apollo study	Dara-pom-dex	vs	Pom-dex
CMRG04 study	Dara-dex-cyclo-pom	vs	Dara-dex-cyclo
Ikema study	Isa-car-dex	vs	Car-dex





Relapsed/refractory MM (RRMM) Based on IMiD, PI, anti-CD38

Apollo study - Phase 3:

A: Daratumumab SC + pomalidomide + dexamethason

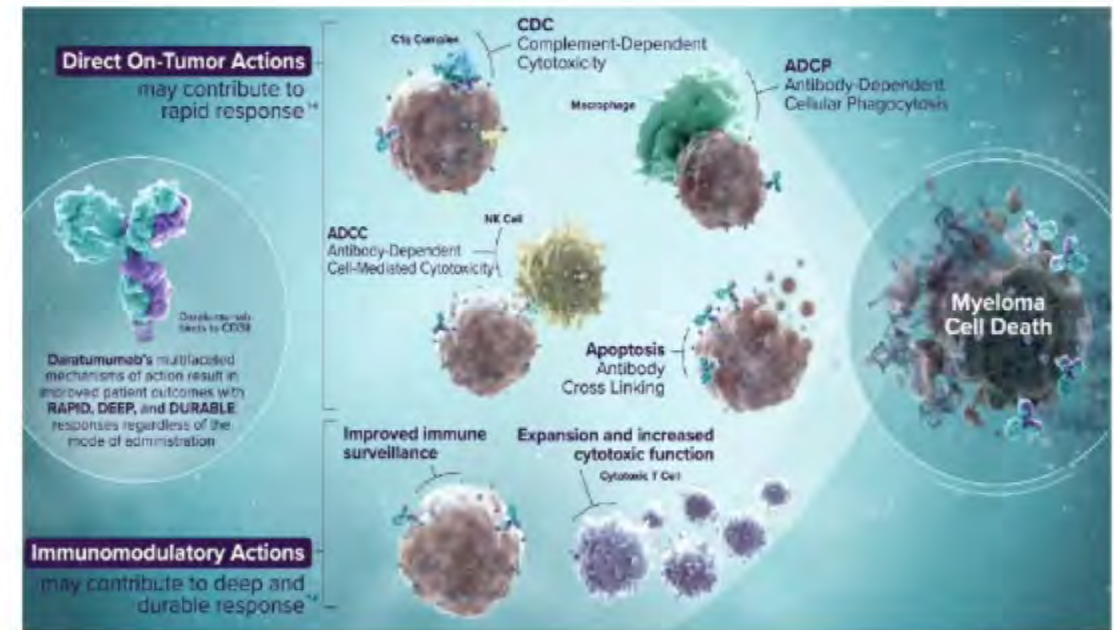
VS

B: Pomalidomide + dexamethason

RRMM, 1 or more previous lines, including lenalidomide and a PI

In previous phase 1-2 study: safe and effective regimen DARA-iv + pom-dex

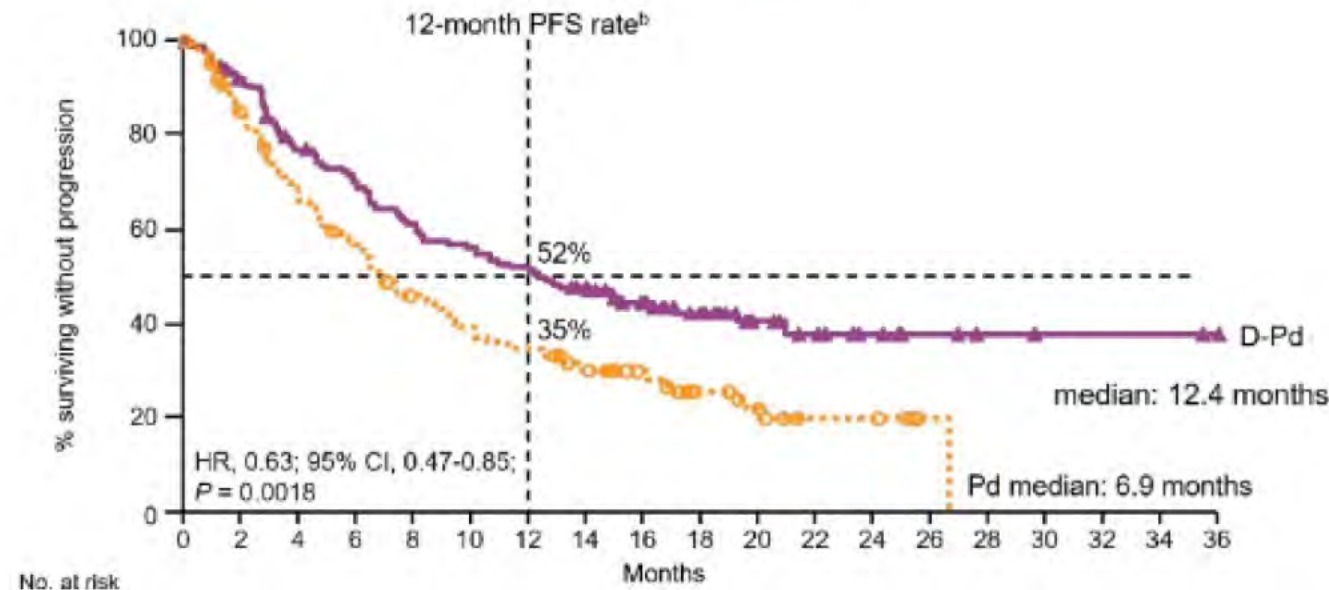
Number of patients: A: 151 vs B: 153



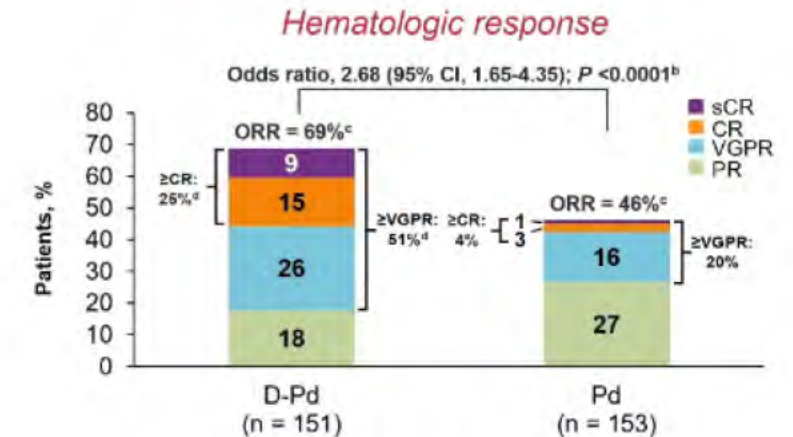


Relapsed/refractory MM (RRMM) - early relapse

Based on IMiD, PI, anti-CD38



Depth of Response^a



DARA SC plus Pd is an effective and convenient treatment for patients with RRMM who received ≥ 1 prior therapy, including lenalidomide and a PI



Relapsed/refractory MM (RRMM) - early relapse

Based on IMiD, PI, anti-CD38

CMRG04 - Phase 2 study

Arm A: daratumumab + dexamethasone + cyclophosphamide + pomalidomide
vs

Arm B: daratumumab + dexamethasone + cyclophosphamide

RRMM, 1 or more previous lines, no previous daratumumab or pomalidomide

Number of patients: 61 + 59

Median prior lines: 2



Relapsed/refractory MM (RRMM) - early relapse

Based on IMiD, PI, anti-CD38

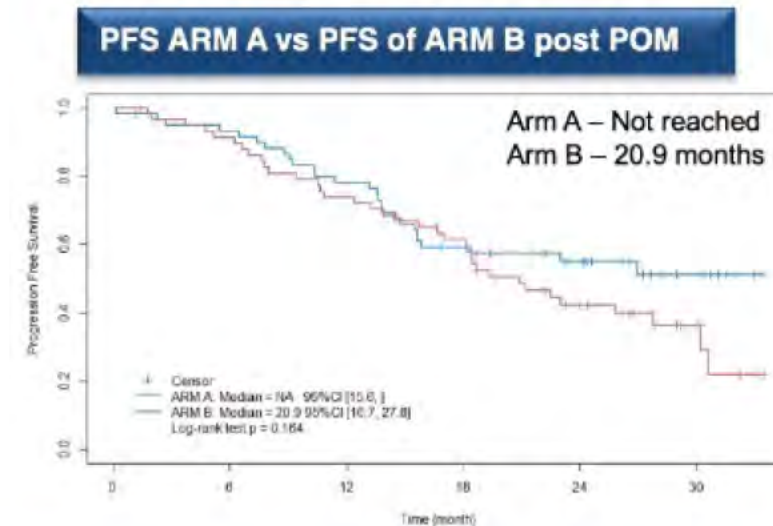
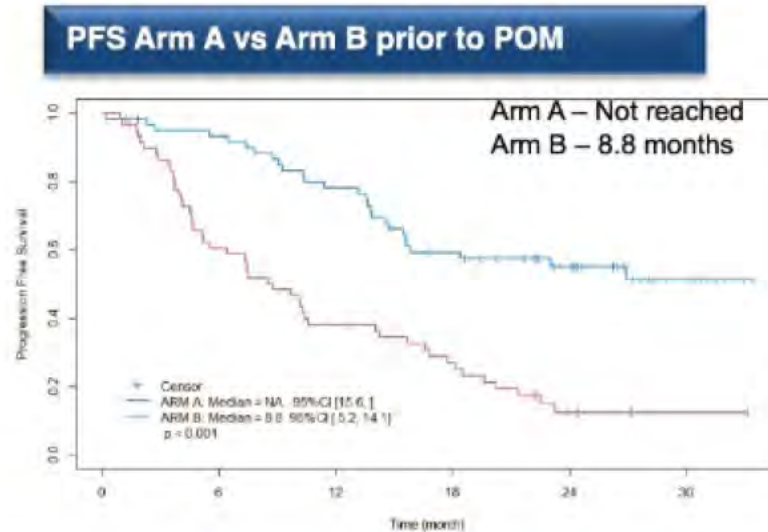
Median follow-up: 25.3 months

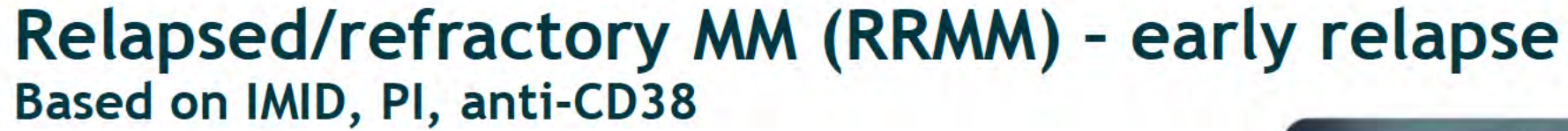
Around 40% of treatment discontinuation was because of PD

ORR 88.6 vs 50%

Adverse events - grade 3 or higher

- neutropenia:	85%	29%	50%
- febrile neutropenia:	13%	3%	20%
- thrombocytopenia:	8%	12%	13%
- anemia:	13%	22%	22%
- pneumonia:	21%	7%	26%





Isatuximab + carfilzomib + dexamethasone

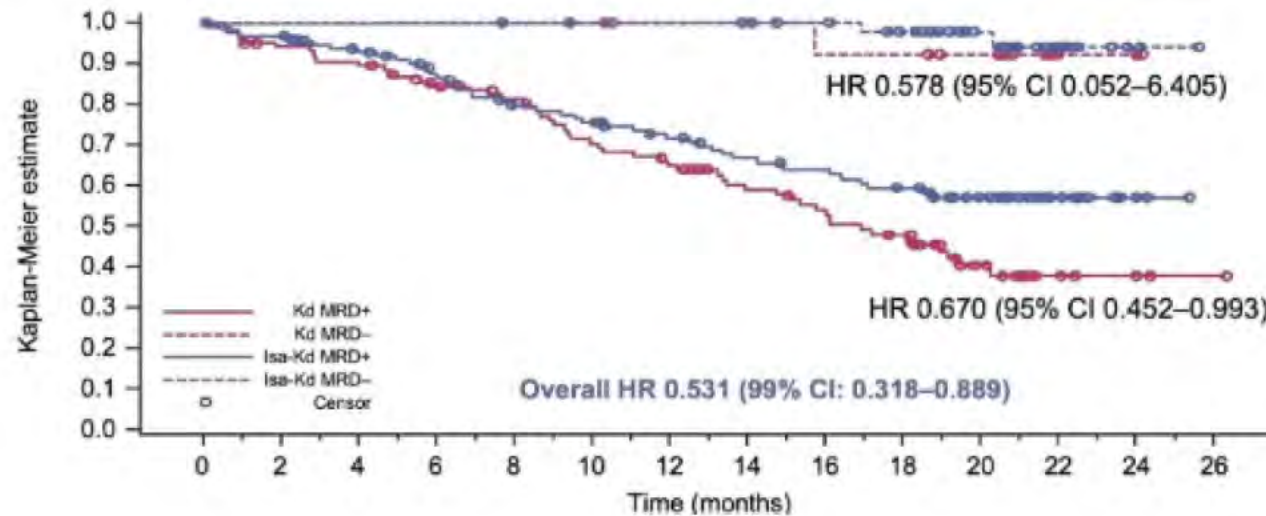
VS

N=123

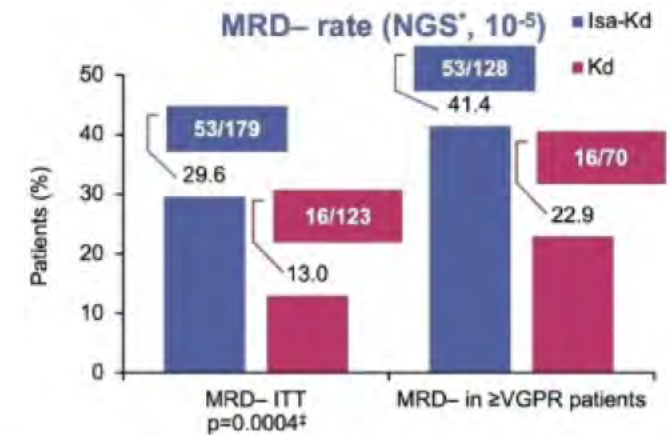
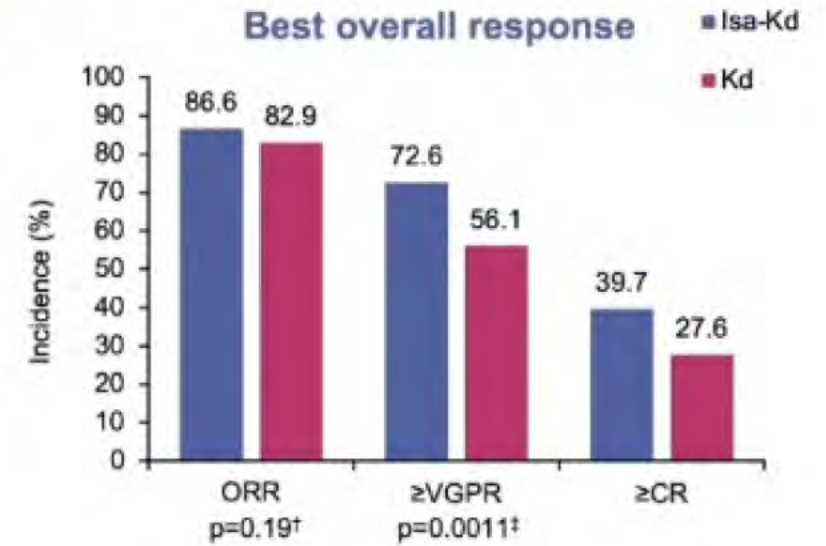


Relapsed/refractory MM (RRMM) - early

Based on IMiD, PI, anti-CD38



Longer response and deeper response for Isa-Car-Dex!





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AL amyloidosis

Take home messages

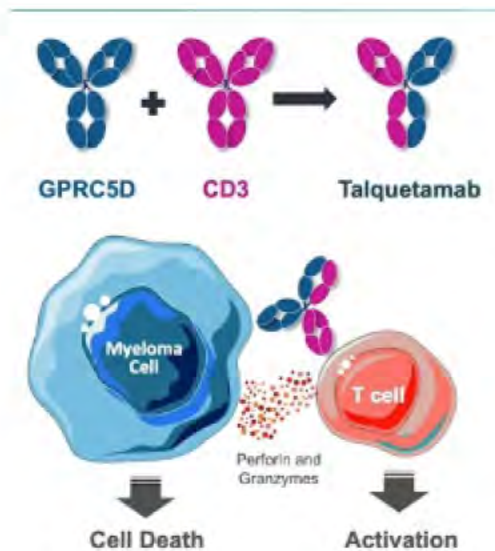


Relapse/refractory MM (RRMM)

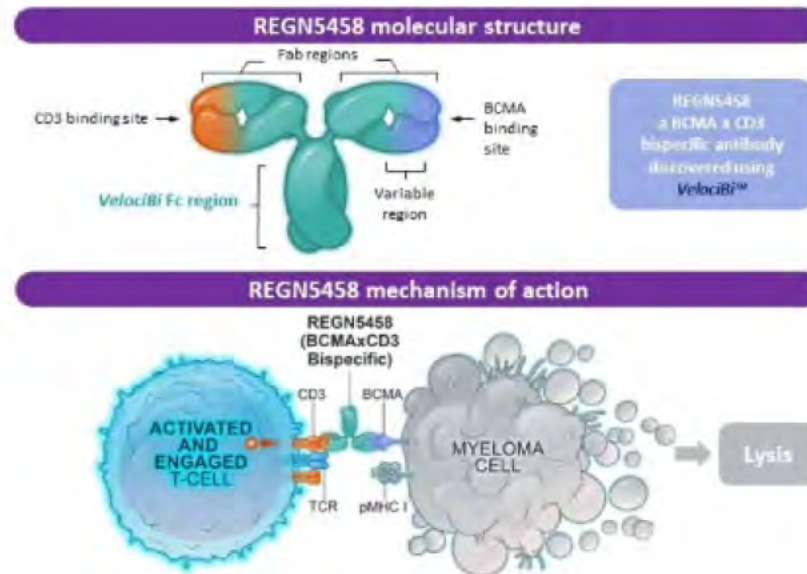
Bispecific

Mechanisms of action:

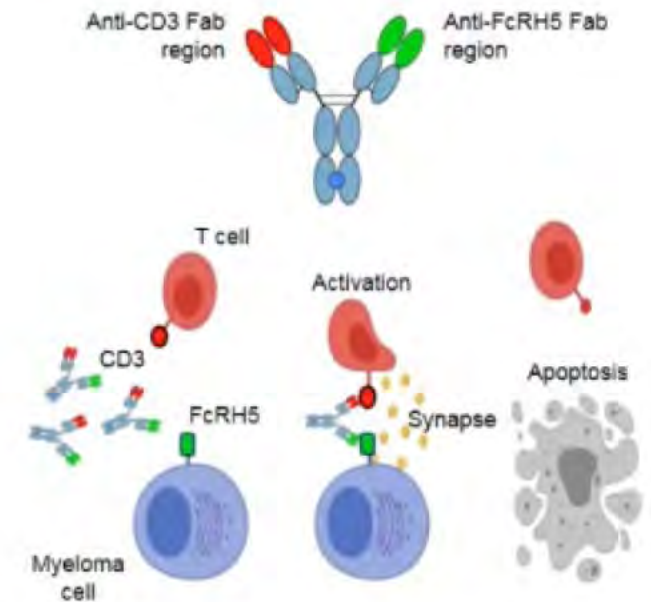
GPRC5D



BCMA



FcRH5





Relapsed/refractory MM (RRMM) Bispecific

Paper ID	Name	Study drug	Target	Phase	Form	Number of patients	median lines prior therapy	CRS grade 3+	Evaluable patients	ORR	VGPR or better	median duration of response	other
290	Chari	Talquetamab	GPRC5D	1&2	IV and SC	157/19	6	5/0%	13	69%	39%	RP2D: 0/17 PD bij mFU 3.7m	Q1W or Q2W
291	Madduri	REGN5458	BCMA	1	IV	49	5	0%	8 at DL6	62.5%	62.5%	6m in all responders, 74% is still ongoing treatment	Q1W, later Q2W. Improvement in HRQoL
292	Cohen	Cevostamab	FcRH5	1	IV	53	6	2%	34, >3.6/20mg	53%	32%	8 pt mDOR >6m	Q3W
293	Rodriguez	TNB-383B	BCMA	1	IV	58	6	0%	15, >40mg	80%	73.3%	81% still ongoing (22/27)	Longer half life: Q3W
180	Garfall	Teclistamab	BCMA	1	IV and SC	84/65	6	0%	22 (SC)	73%	55%	15/16 are still responding at 3.9m	Q1W
181	Harrison	AMG-701	BCMA	1	IV	85	6	9%	6	83	50	17/21 ongoing at FU of 6m	Q1W

Safety		Grade 3 or higher - hematologic			Non hematologic	
Paper ID	Name	Neutropenia	Thrombopenia	Anemia	Infections	
290	Chari	42%	5%	0%	0%	
291	Madduri	14%	6%	22%	18%	
292	Cohen	15%	25%	19%	-	
293	Rodriguez	16%	14%	17%	14%	
180	Garfall	33%	12%	21%	27%	at recommended RP2D
181	Harrison	25%	21%	42%	17%	all grade AE's

Future perspective:
more phase 2 and 3
studies



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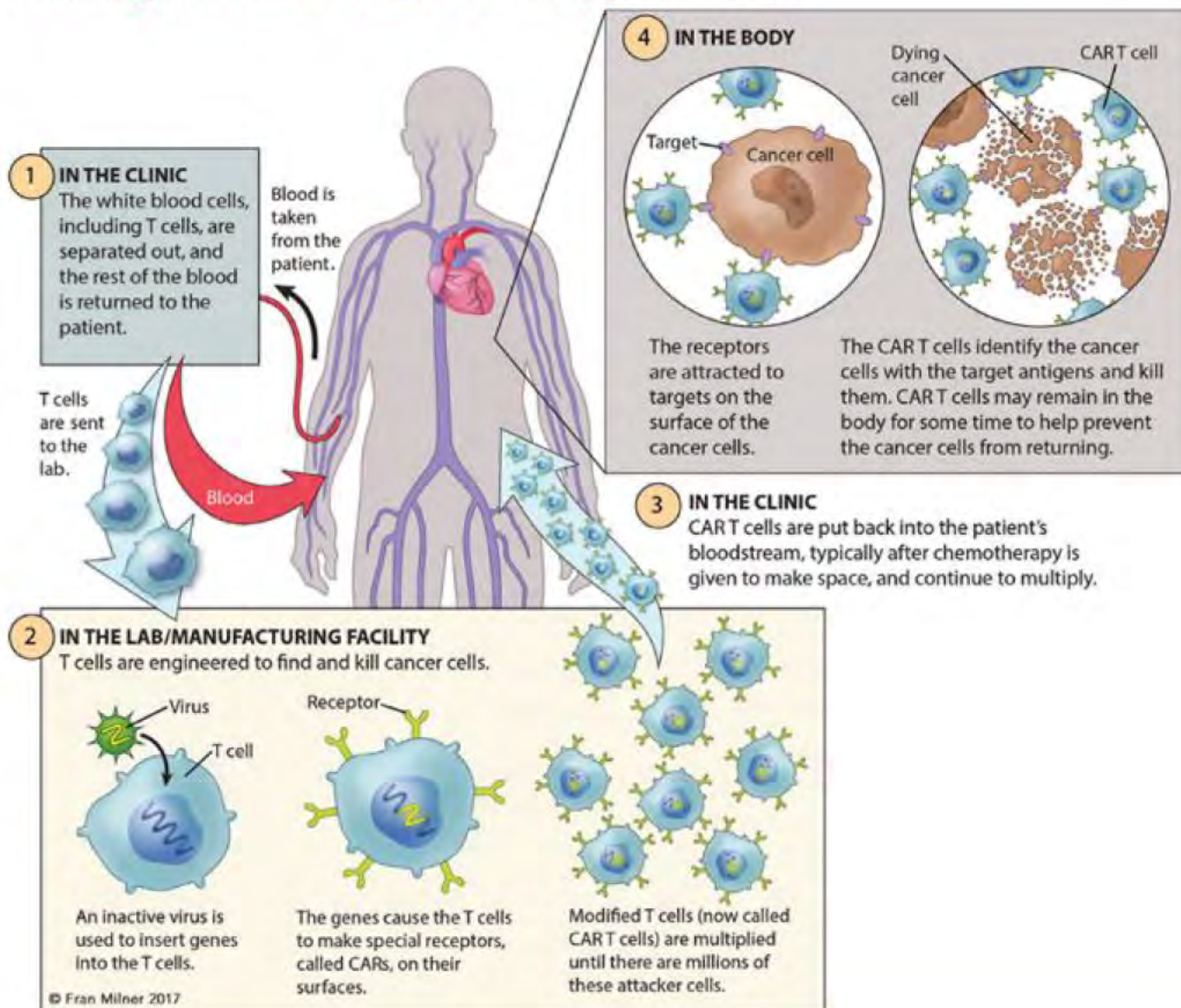
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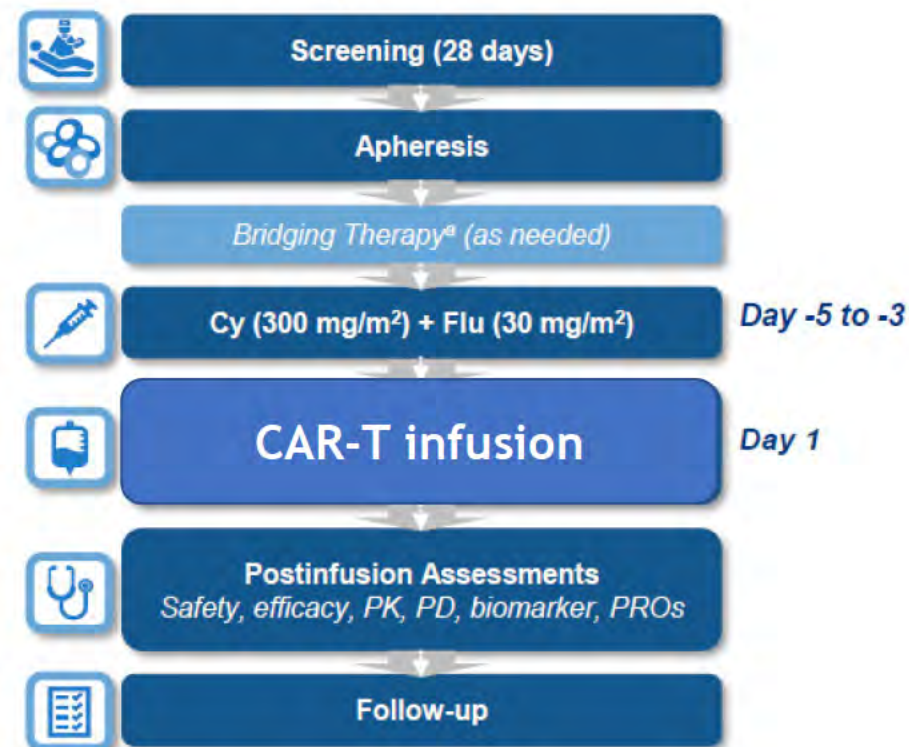
AL amyloidosis

Take home messages

Autologous CAR T-Cell Therapy Process



Study scheme



Key Eligibility Criteria

- Progressive MM per IMWG criteria
- ECOG PS ≤1
- Measurable disease
- ≥3 prior therapies or double refractory
- Prior PI, IMiD, anti-CD38 therapy

Relapsed/refractory MM (RRMM) CAR-T



DOR: duration of response; no: number; ORR: overall response rate; pts: patients; RRMM: relapsed refractory multiple myeloma; VGPR: very good partial response

Study	Name	Study drug	Target	Phase	No pts	Prior lines	CRS grade ≥ 3	Neuro tox ≥ 3	ORR (%)	\geq VGPR (%)	PFS (mo)	AE grade ≥ 3	Other
KarMMA ¹	Raje	Ide-cel (bb2121)	BCMA	1	128	6 (3-16)	5		73	53	>8.8	99	
CRB-401 ²	Lin	Ide-cel (bb2121)	BCMA	1	62	6 (3-18)	7	2	76		8.8	98 Infect 23%	
CARTITUDE-1 ^{3,4}	Madduri	Cilta-cel	BCMA (2x)	1b/2	97	6 (3-18)	5	9	97	93	77% 12 mo	Hem: 99% Infect 20%	Triple R 88% penta 42%
GC012F ⁵	Jiang	GC012F	BCMA and CD19	1	16	5 (2-9)	13	-	100% (n=6)				Penta E 63%.
C-CAR088 ⁶	Lu	C-CAR088	BCMA	1	23	4 (2-12)	4	-	96	92	56% 6 mo	Infect 26%	
CT053 ⁷	Hao	CT053	BCMA	1		5 (2-11)	-	4	88		19	Hem:100% Infect 25%	
LUMMICAR ⁸	Kumar	CT053	BCMA	1b/2	20	5 (3-11)	-	few	94			Hem:100% Infect 10%	Penta R 50%
PRIME ⁹	Castello	P-BCMA-101 (Piggybac)	BCMA	1(/2)	55		-	4	44-75				Prior CAR-T allowed
UNIVERSAL ¹⁰	Mailankody	ALLO-715 (allogeneic)	BCMA	1	26		-		To 60				Of the shelf
CRB-402 ¹¹	Alsina	CRB-402 (bb21217)	BCMA (+PI3Ki)	1	69	6 (3-17)	1	4	68-84			Infect 26%	Triple R 67%

1. Raje et al. Abstract #3234

2. Lin et al. ORAL #131

3. Madduri et al. ORAL #177

4. Lin et al. Ciltacabtagene autoleucel. POSTER #324

5. Jiang et al. ORAL #178

6. Lu et al. ORAL #182

7. Hao et al. ORAL #132

8. Kumar et al. ORAL #133

9. Castello et al. ORAL #134

10. Mailankody et al. ORAL #129

11. Alsina et al. ORAL #130



Content

Introduction

Newly diagnosed MM

- Transplant eligible / role of autologous stem cell transplant
- Non-transplant eligible

Relapsed/refractory MM (RRMM) - early relapse

- Based on IMiD, PI, anti-CD38

Relapsed/refractory MM - late relapse

- Bispecifics
- CAR-T
- **Antibody drug conjugates**

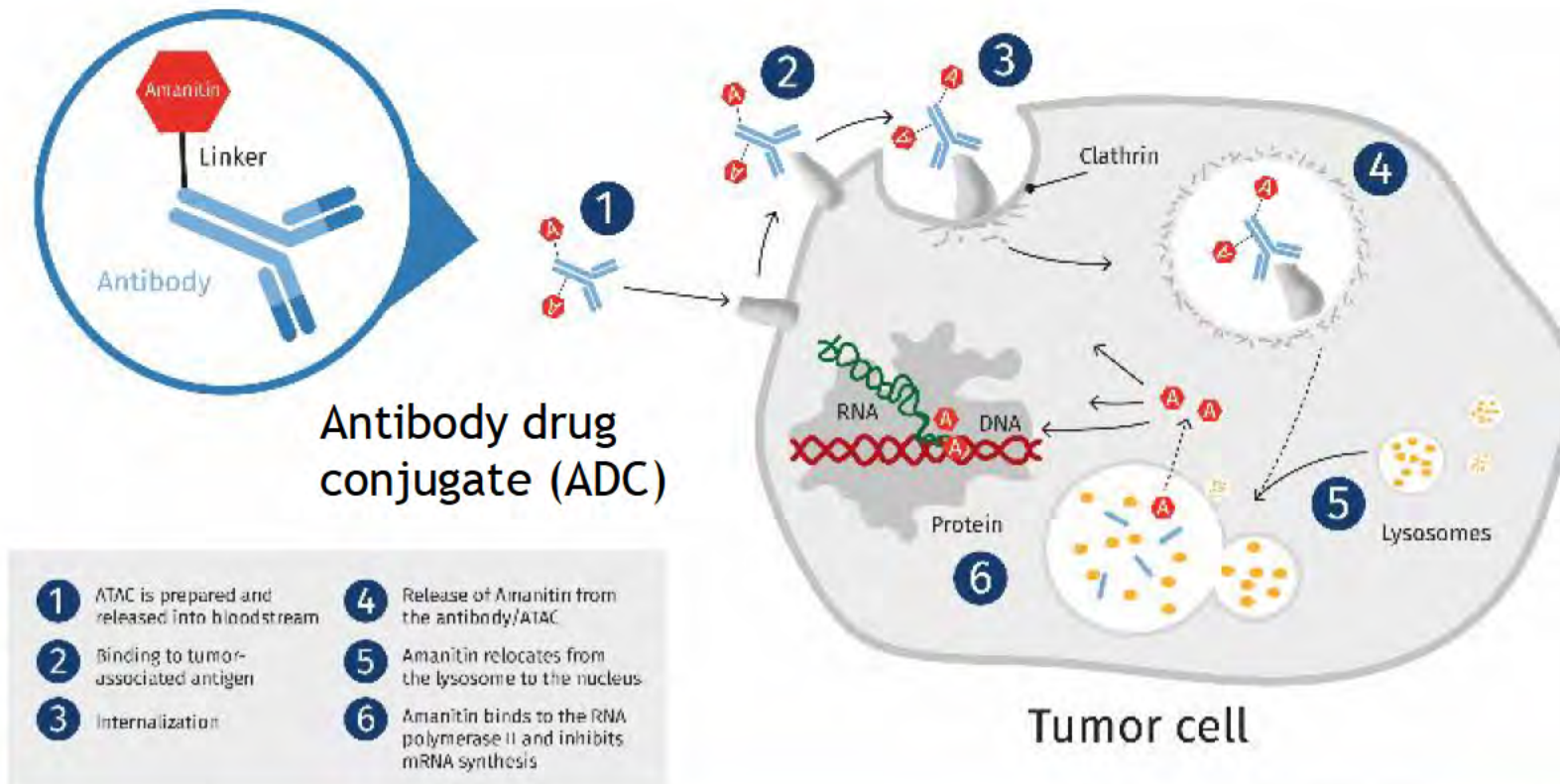
AL amyloidosis

Take home messages



Relapsed/refractory MM (RRMM)

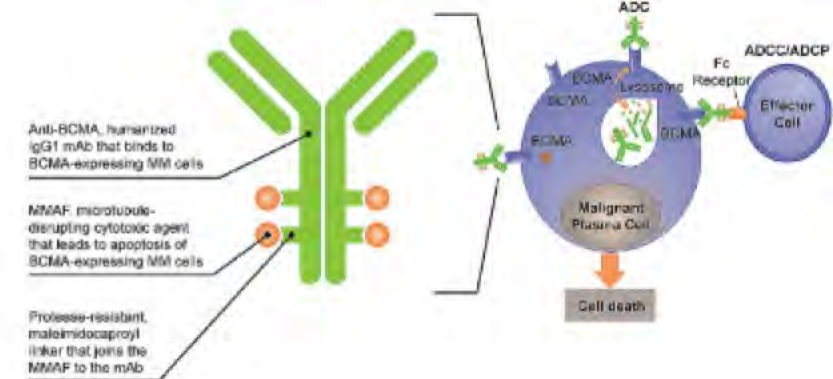
Antibody drug conjugates





Relapsed/refractory MM (RRMM)

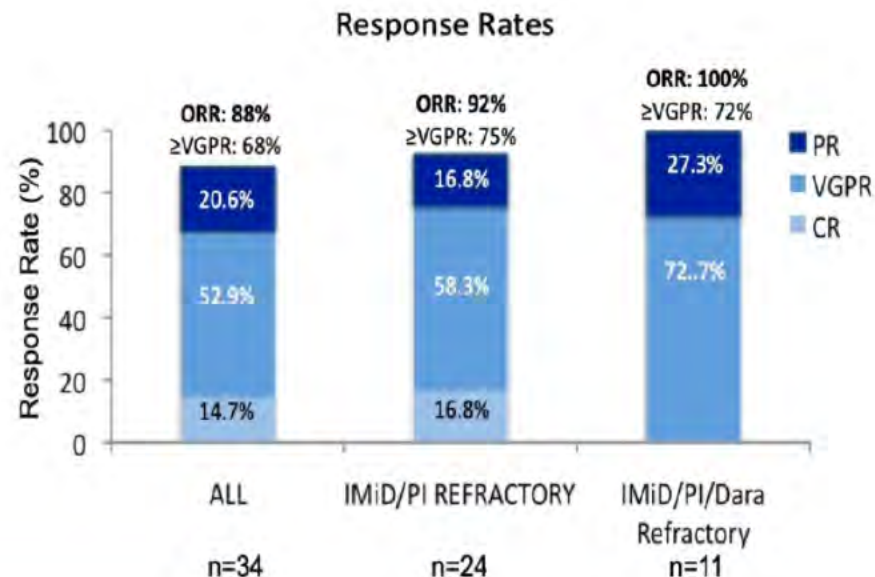
Antibody drug conjugates



Belantamab-mafodotin (BELAMAF) - added to pomalidomide-dexamethasone

Phase I ALGONQUIN study (n=37)

Prior lines 3 (1-5)



TEAE	Any Grade	≥ Grade 3
Keratopathy	28 (75.7%)	19 (51.4%)
Neutropenia	21 (56.8%)	15 (40.5%)
Thrombocytopenia	18 (48.6%)	12 (32.4%)
Decreased visual acuity	17 (45.9%)	6 (16.2%)
Fatigue	15 (40.5%)	4 (10.8%)
Fever	13 (35.1%)	1 (2.7%)
Cataract	13 (35.1%)	1 (2.7%)
Constipation	12 (32.4%)	0
Diarrhea	11 (29.7%)	0
Infusion related reaction	11 (29.7%)	2 (5.4%)



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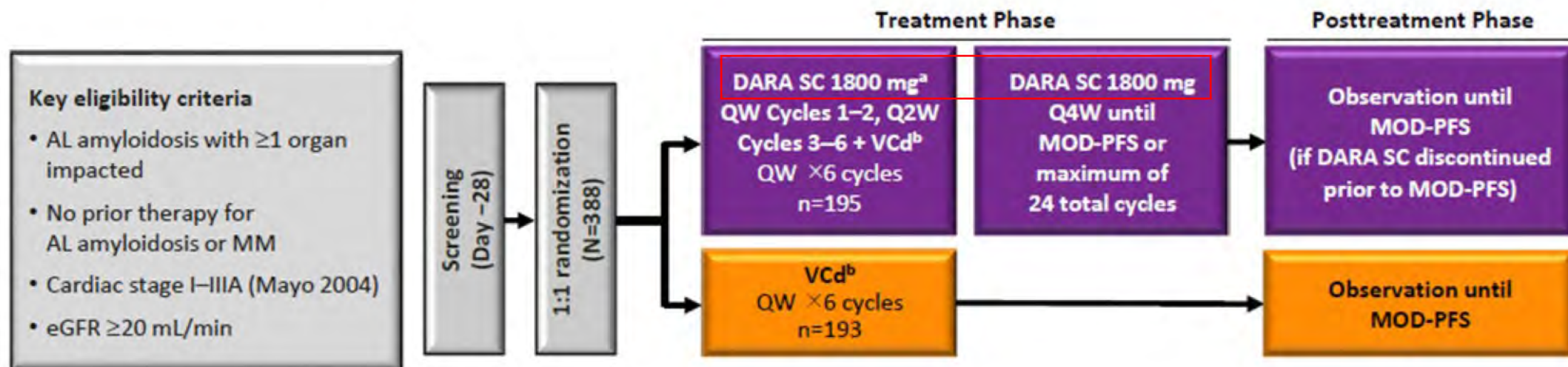
AL amyloidosis

Take home messages



AL amyloidosis

ANDROMEDA trial



Dara: daratumumab; MOD-PFS: major organ deterioration-progression free survival; QW: weekly ; Q4W: once per 4 weeks; VCD: bortezomib-cyclophosphamide-dexamethasone

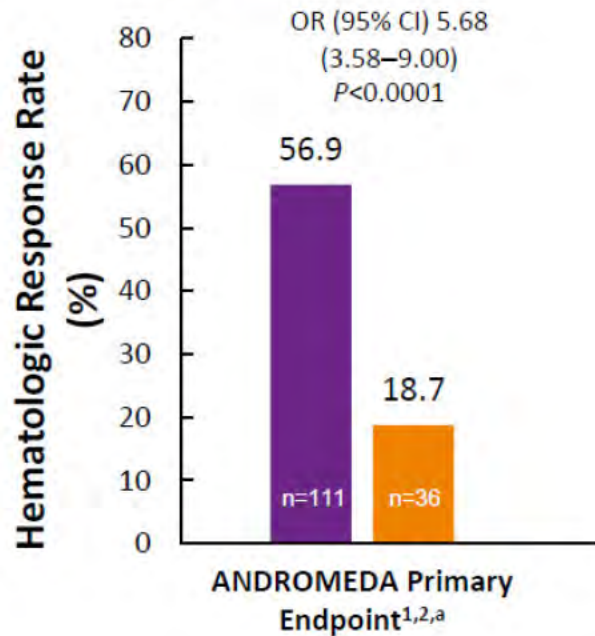
ANDROMEDA is a randomized, open-label, active-controlled, phase 3 study of DARA-VCd versus VCd alone in patients with newly diagnosed AL amyloidosis



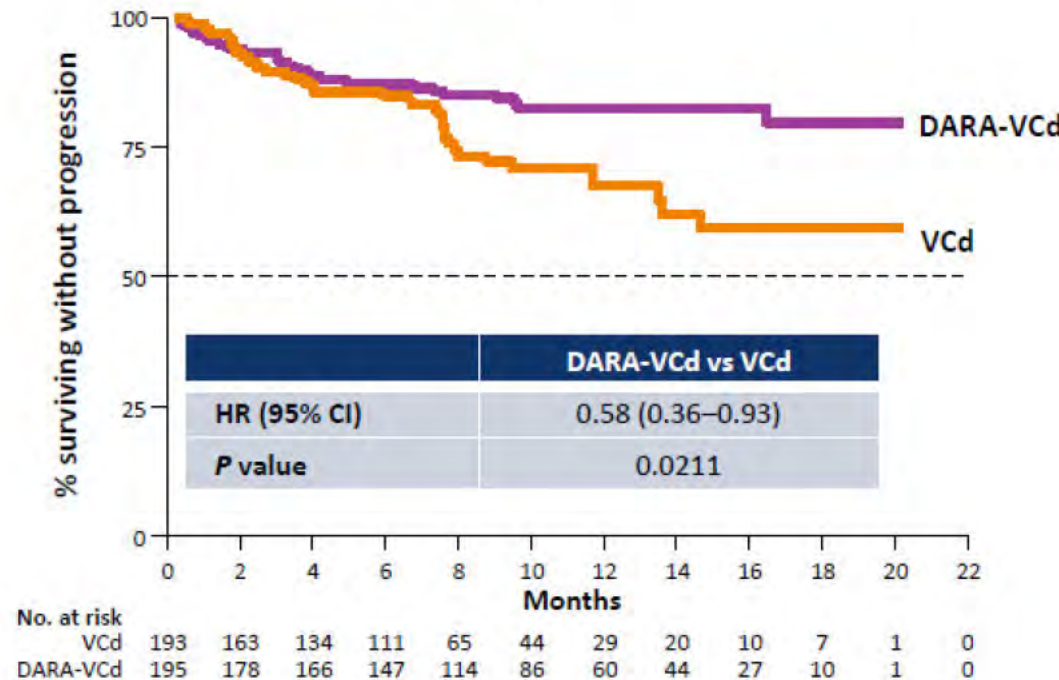
AL amyloidosis

ANDROMEDA trial

Response



Major organ deterioration PFS



Treatment with DARA-VCd substantially delayed major organ deterioration, hematologic progression, or death



AL amyloidosis

Real-world outcomes

EMN23: Collaboration between European centers to assess real-world

Goals:

- Describe the disease burden and treatment of AL-amyloidosis in real-world

Participating countries

Current enrolment:
2,787 patients



Video placeholder

	66
	18
	500
	290
	256
	1349
	165
	20
	123
	pending



Take home messages

Myeloma field is evolving rapidly

Addition of daratumumab in first line in near future?

Still a role for autologous stem cell transplant

New combinations with anti-CD38, IMiD and/or PI for early relapsed MM

Development of new promising agents

- CAR-T, bispecifics and many more...

